PATENT SPECIFICATION

DRAWINGS ATTACHED

884,194

Date of Application and filing Complete Specification: Feb. 13, 1958.

No. 4773/58.

Application made in United States of America on June 6, 1957.

Complete Specification Published: Dec. 6, 1961.

Index at acceptance:—Classes **96**, A7AX, A7B(12:15:19:23), B(1:2A:2B:15); **18**, A6H8; **31(1)**, B5(D:F:J1:J2:P:Q2:S), D; **and 94(1)**, C3B1, C10(B1B:B1D1:D1:D3B3:D3B4:F1:F3:J1:J4E:T1A:T5:U).

International Classification:—**D21f, h. B31f. B65b, d.**

COMPLETE SPECIFICATION

ERRATA

SPECIFICATION NO. 884,194

Page 3, line 120, *for* "wih" *read* "with"

Page 4, line 76, *for* "angular" *read* "angularly"

Page 4, line 92, *for* "streams" *read* "stream"

Page 5, line 47, *for* "s" *read* "as"

Page 5, line 94, *for* "cased" *read* "closed"

Page 6, line 78, *for* "matt" *read* "batt"

E PATENT OFFICE,
3rd April, 1962

DS 61748/1(17)/R.153 200 3/62 PL

fibres loosely felted or adhering together.

It is immaterial for purposes of the present invention how the batt strip is initially formed, some suitable machines for forming continuous batt strips for use in pad making according to the present invention being disclosed in the copending applications Nos. 4770/58, 4771/58, 4772/58 (Serial Nos. 884,191, 884,192 and 884,193).

In accordance with the present invention a strip of fibrous batt material is formed into pad portions by removing segments of the batt strip by subjecting said segments to a pneumatic pressure differential that acts to remove the batt segments from the strip. The segments, which may be of substantial width, are conveniently removed by a convection current of air which picks up the material constituting the batt segments, removes it from the strip and returns it to a batt forming machine for reuse in the making of batt strips. I have found that the required pneumatic pressure differential can most conveniently be established by subjecting the batt segment to suction. In some instances, the pressure differential is advantageously increased by impinging a stream of air against the side of the segment opposite that subject to the suction.

dinally spaced points into pad portions spaced longitudinally by dividing gaps, said pad portions being then encased in a continuous wrapping of paper or other wrapping material, that is, the wrapping material extends beyond the separated pad portions to include the spacing gaps intervening therebetween. In the continued advance of the encased pad portions the opposed plies of wrapping material lying opposite the gaps are severed through to form individual wrapped pads, the portions of wrapping material lying opposite said gaps being preferably first pressed together and then adhesively sealed.

The knife means employed preferably sever a paper wrapping in the regions of the gaps with a tearing action, so as to divide the encased pad portions into separate wrapped pads. While the pads made according to the present invention may be used for any suitable purposes, they are specifically intended for use as cushion pads in the packaging of furniture. Such pads must be sturdy to withstand shipping and handling stresses and yet provide a soft cushion to protect the furniture. Moreover, the pads may not have any abrasive or rough surfaces which might otherwise scratch the furniture finish. Suitable pads for

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International Classification:—D21f, h. B31f. B65b, d.

COMPLETE SPECIFICATION

Improved method and apparatus for Forming Individual Pads from Fibrous Batt Material

I, CURT GEORGE JOA, a citizen of the United States of America, of 726, Fond du Lac Avenue, City of Sheboygan Falls, Wisconsin, United States of America, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to fibrous pads and has for its main object to provide improved methods and apparatus for forming individual pads from fibrous batt material in strip form and for covering the individual pads so formed. The term "butt material" means a fleece or web of dry or comparatively dry fibres loosely felted or adhering together.

It is immaterial for purposes of the present invention how the batt strip is initially formed, some suitable machines for forming continuous batt strips for use in pad making according to the present invention being disclosed in the copending applications Nos. 4770/58, 4771/58, 4772/58 (Serial Nos. 884,191, 884,192 and 884,193).

In accordance with the present invention a strip of fibrous batt material is formed into pad portions by removing segments of the batt strip by subjecting said segments to a pneumatic pressure differential that acts to remove the batt segments from the strip. The segments, which may be of substantial width, are conveniently removed by a convection current of air which picks up the material constituting the batt segments, removes it from the strip and returns it to a batt forming machine for reuse in the making of batt strips. I have found that the required pneumatic pressure differential can most conveniently be established by subjecting the batt segment to suction. In some instances, the pressure differential is advantageously increased by impinging a stream of air against the side of the segment opposite that subject to the suction.

For economy in and for convenience of manufacture it is desirable for the pad forming operation, and any required covering of the pads, to be carried out as the strip of batt material is in motion on a discharging conveyor belt, such as a discharge conveyor as provided in the apparatus disclosed in the copending applications referred to. It is therefore a further object of this invention to provide methods and apparatus for pad forming and pad covering which accommodate for such motion.

In one form of machine according to this invention fibrous batt material issuing continuously as one or more elongated strips from a batt forming machine is divided at longitudinally spaced points into pad portions spaced longitudinally by dividing gaps, said pad portions being then encased in a continuous wrapping of paper or other wrapping material, that is, the wrapping material extends beyond the separated pad portions to include the spacing gaps intervening therebetween. In the continued advance of the encased pad portions the opposed plies of wrapping material lying opposite the gaps are severed through to form individual wrapped pads, the portions of wrapping material lying opposite said gaps being preferably first pressed together and then adhesively sealed.

The knife means employed preferably sever a paper wrapping in the regions of the gaps with a tearing action, so as to divide the encased pad portions into separate wrapped pads. While the pads made according to the present invention may be used for any suitable purposes, they are specifically intended for use as cushion pads in the packaging of furniture. Such pads must be sturdy to withstand shipping and handling stresses and yet provide a soft cushion to protect the furniture. Moreover, the pads may not have any abrasive or rough surfaces which might otherwise scratch the furniture finish. Suitable pads for

the packaging of furniture are provided by this invention.

For the purpose of removing fibrous batt material segments to provide the spacing gaps a suction box may be disposed in fixed relation to a batt strip conveyor. The suction box may be held continuously at subatmospheric pressure, or at such pressure only periodically as the strip passes the suction box inlet. The convection current which flows into the suction box is preferably localized or channelled to confine it, so as to affect only the batt segments to be removed, by at least partially enclosing the segment within an air confining hood. I may optionally blow air into the end of the hood opposite the suction box inlet. The air blower (and if desired the suction pump also), is desirably actuated only for that period of time during which a batt segment for removal is opposite the suction box inlet. At all other times the air blower is out of action so as to permit the strip to pass without change of form.

Continuous strips of pre-glued wrapping paper are preferably applied to the longitudinally separated pad portions and then made into a continuous flat sleeve or tube encasing the pad portions; thereafter, the paper sleeve or tube is sealed in the areas of the spacing gaps and severed as aforestated.

To avoid formation of abrasive material on the outer surface of the pad, such as might be formed by extrusion of conventional glue from between the plies of wrapping paper as they are sealed together, I use adhesive which is very pliable even after it has set. Accordingly, such glue as is extruded will be very pliable, even after setting, and will not scratch finished furniture surfaces. Moreover, the wrapping paper is desirably severed by tearing it to fray out the fibres of the paper and entrapped glue. This avoids a sharp or clean cut edge which might otherwise abrade or scratch furniture finish. A serrated-edge pad having the foregoing characteristics is the subject of my copending Patent Application No. 42798 of 1960 (Serial No. 884,201).

The invention is illustrated, by way of example, in the accompanying drawings, wherein:

Figure 1 is a diagrammatic perspective view illustrating the basic operations of forming pad portions from a single continuous fibrous batt strip and of wrapping such pad portions.

Figure 2 is a side elevation, partly in cross section, and still of a diagrammatic nature, showing a machine of the basic form illustrated in Figure 1, but adapted for operating on a plurality of batt strips simultaneously.

Figure 3 is a vertical cross sectional view taken along the line III—III of Figure 2.

Figure 4 is a part-sectional end view, looking in the direction of arrow IV, in Figure 3.

Figure 5 is an enlarged fragmentary perspective view showing suction means and an associated compacting roller respectively forming part of and being located in the vicinity of the apparatus shown in Figures 3 and 4.

Figure 6 is a greatly enlarged fragmentary view, partly in cross section, of cut-off apparatus for severing ensleeved pad portions into individual wrapped pads.

Figure 7 is a fragmentary view similar to Figure 6, but showing the position of the parts during severing co-action of the knife blades.

Figure 8 is a fragmentary side view of the stationary knife blade and its push-off blade, looking in the direction of arrow VIII in Figure 7.

Figure 9 is a perspective view of a cushioning pad as produced by the method and apparatus of the present invention.

Figure 10 is an enlarged cross section taken through the completed pad of Figure 9, that is, on line X—X of Figure 9.

Figure 11 is an enlarged fragmentary plan view of the severed margin of a pad, looking in the direction of arrow XI in Figure 9.

The discharging end of a batt forming apparatus, such as one of the construction described in my prior application No. 4770/58 (Serial No. 884,191) is included at the right-hand end of Figure 2 and includes a screen 15 on which fibrous material 16 is deposited in the form of a batt 17 which is discharged from the screen in the form of a batt strip 18; a levelling device 19 functions to provide for substantially uniform thickness and density of the batt material.

An end product of the method and machine of the present invention is illustrated in Figure 9 in the form of a cushion pad 22 which is shown issuing from the machine at the left hand end of Figure 2. The pad 22 may be used for packing, a particular use being that of a filler pad in furniture shipping cartons. The loosely compacted portion 33 of batt material of such a pad is not self-sustaining and is ensleeved in a paper wrapping consisting of a base strip 23 having its side margins formed into channels to receive therein the pad portion 33 and to overlap the longitudinal marginal edges of a cover strip 24.

To keep the pad portion 33 secure against shifting movement within the wrapper the inner surfaces of the wrapping strips 23, 24 are coated with glue layers 25, 26 respectively (Figure 10).

Figure 1 diagrammatically illustrates pad forming and wrapping operations effected on a single continuous strip 18 of batt material as it is discharged from the batt forming machine 14, said strip 18 being received on a discharge conveyor belt 27, on which it is conveyed beneath a compacting roller 30, and past appropriate means for creating a convection current of air. As illustrated in Figure 1, the inlet tube 28 of a suction pump or blower 31 may

be disposed at one side of the belt 27 and a nozzle 29 discharging air under pressure may be disposed at the other side of the conveyor belt 27. Accordingly, a stream of air flows across the conveyor belt 27 to remove by convection a segment of batt material intervening between the suction inlet tube 28 and pressure air nozzle 29.

To localize and channel the convection current I find it desirable to position temporarily on the batt strip 18 an air hood 32, which preferably presses down on to spaced portions of the batt strip 18 to define the batt segment to be removed by the convection current. Successive removal of such segments, as the batt strip 18 travels with belt 27, subdivides the strip 18 into a row of pad portions 33 longitudinally spaced by gaps 47.

It is broadly immaterial if all of the apparatus 28, 29, 32 moves as a unit with the conveyor belt 27 in the course of removing the batt segment by convection. In the preferred form herein illustrated the suction tube 28 and air nozzle 29 are relatively stationary and intermittently operated in time with the advance of the elongated strip 18 on conveyor belt 27 to remove batt segments at positions appropriately spaced in said batt strip 18.

In any event, the batt strip 18, having been sub-divided into longitudinally spaced pad portions 33, these portions are discharged from conveyor belt 27 onto the strip base 23 of wrapping paper which is drawn over a guide roller 34 and onto an apron 42. The base strip 23 is unwound from a supply roll 35 and passes through glueing apparatus 36 including a glue tank 37 and transfer roll 38 which coats the surface of the base strip 23 which is uppermost on apron 42.

The cover strip 24 of wrapping paper is applied to the upper surface of the pad portion 33 after having been unwound from a supply roll 43 and having received a coating of glue from glue tank 44 and transfer roller 45. The cover strip 24 is of substantially the same width as the pad portion 33, but the base strip 23 is somewhat wider, so that the longitudinal marginal edges thereof may be folded by conventional folders 46 to form side channels which overlap the marginal edges of cover strip 24. As illustrated in Figure 2, the folders 46 may gradually taper toward their outlet ends to press the wrapping paper against the ensleeved pad portions 33 while the adhesive at least partially sets.

By the foregoing operation, the continuous wrapping paper strips ensleeve the spaced-apart pad portions 33 and also the gaps 47 therebetween.

As the ensleeved longitudinally spaced pad portions 33 are discharged from conveyor 39, rotary sealing dies 48, timed to co-act only when the gaps 47 are therebetween, press together portions of the wrapping strips 23, 24 which are at opposite sides of the gaps 47 between the pad portions 33. Accordingly, the glue coated on the facing surfaces of the strips seals the strips together under pressure of the dies 48 to constitute connective links 49 between the successive ensleeved pad portions 33.

After sealing, the ensleeved pad portions 33 are further compressed between co-acting belt conveyors 52, 53 during continued advance thereof. Meanwhile the glue coatings 25, 26 have had time to set and the spaced-apart uncut pads 22 are in due course discharged from between the conveyors 52, 53 onto a spring biased apron 54 preceding pad severing apparatus which is shown diagrammatically in Figures 1 & 2 and in greater detail in Figures 6 to 8.

The apparatus for severing through the flattened and sealed connective links 49 intervening between the pads 22 consists of co-acting knife blades 55, 56 respectively having teeth serrations 57, 58 which intermesh in the co-action of the blades. The knife 55 is stationary, being mounted on a fixed support 59, and the knife 56 made movable by being mounted on a rotary shaft 62 having an axis of rotation offset from the stationary knife 55. Accordingly, the rotary knife 56 sweeps past the stationary knife 55 in a downward and forward direction.

The apron 54 is normally biassed by spring means 63 to the position shown in Figure 6, in which the discharge end of the apron 54 is above the level of the teeth 57 of knife 55. Accordingly, except during the time of knife co-action, the conveyors 52, 53 will simply feed the linked pads 22 through the gap between the open knives 55, 56 onto a take-away conveyor belt 64. However, when the rotary knife 56 reaches the position shown in Figure 7, in which its teeth 58 co-operate with the teeth 57 of the knife 55, the downward component of thrust of knife 56 will compress spring means 63 and depress apron 54 to lower the connective links 49 onto the teeth 57 of blade 55. After severance of the links 49, the spring means 63 will lift the apron 54 back into the elevated position shown in Figure 6, in which position the next pad 22 will clear the stationary knife 55 in its continued advance through the machine.

To ensure disengagement of the teeth 57 of stationary knife 55 from the severed edges of the connective links 49, blade 55 is provided wih a push-off bar 65 mounted for reciprocation on the knife 55 by reason of the engagement of pins 66 projecting from bar 65 with slots 67 formed in the blade 55. The push-off bar 65 is provided with a bracket 61 connecting it to the rod 68 of the piston 69 of a fluid-operated motor 72. Conventional means (not shown) are provided for co-ordinating the fluid motor 72 with the rotation of shaft 62 for actuating said motor 72 immediately after each pad connecting link 49 is severed.

Accordingly, the push-off bar 65 assists the spring means 63 in clearing the fibres 71 of the severed link 49 from entanglement with the teeth 57 of the blade 55.

The serrated co-acting teeth 57, 58 are regarded as of considerable significance in that a sharp or clean cut severed edge in the link 49 is avoided. By reason of the meshing teeth 57, 58 the connective link 49 is torn in the course of knife co-action therewith. Accordingly, the fibres 71 of the link 49 are frayed out as illustrated in Figure 11. The fraying or tearing action aforesaid is attributed to the difference in peripheral speed of radially offset portions of the serrated knife teeth.

The frayed out fibres 71 are softer and more pliant and less damaging to furniture finish than would be a clean-cut edge, particularly if such edge contains hardened glue. The tearing action aforesaid not only frays out the fibres of the paper wrapping but also frays out such glue as is extruded from between the plies of wrapping paper.

To further reduce the possibility of abrading furniture finish, I may use adhesive which sets in pliable form. Asphalt has been used successfully for this purpose, as well as a rubber base adhesive.

The detailed construction of the preferred apparatus for dividing the batt strip 18 into spaced-apart pad portions 33 is shown in Figures 3, 4, and 5. In practice, it will be more economical to operate simultaneously on a plurality of parallel batt strips 18 as they are discharged from the batt forming machine 14; in Figures 3, 4 and 5, three such batt strips are illustrated. These may first be compacted slightly against a corresponding number of conveyor belts 27 and a common underlying apron 73 by the common compacting roller 30, said apron 73 being provided with ports 75 intervening between the laterally spaced belts 27 and communicating with a suction duct 74 suspended from the apron 73; that is the ports 75 are laterally offset from the path of travel of the respective batt strips 18.

As shown in Figures 3 and 4, the side margins of the apron 73 support side brackets 76 carrying bearings for four cross shafts 77 to the ends of which are secured sprockets 78 which mesh with interconnecting chains 79. One of the shafts 77 has an additional sprocket 82 meshing with a driving chain 83. The driving chain 83 meshes with a drive sprocket 81 mounted on a shaft 84, which derives power through conventional mechanism (not shown) from the same source as that which drives the conveyor belts 27 so that the interconnecting chains 79 move in timed coordination with the batt strip conveyor belts 27.

Laterally aligned, longitudinally spaced air hoods 32 are mounted on the parallel side chains 79 as best shown in Figure 5. At spaced intervals along the chains 79, are provided paired cross-bars 85 onto which the hoods 32 are screwed or otherwise secured. In the specific apparatus illustrated, the chains 79 are provided with two pairs of bars 85 and two sets of hoods 32. It is to be understood that a set of hoods 32 comprises three laterally spaced hoods, one for each batt strip 18. Each hood of a set is of U cross section open at one end and closed with an angular sloped wall 92 at the other end and each hood of the set is long enough to extend at its walled end over one of the ports 75. The longitudinal spacing between the sets of hoods determines the spacing between the gaps 47 formed in the batt strips 18. The lowermost shafts 77 for chains 79 are relatively widely separated so that a set of hoods 32 will be positioned against the advancing batt strips 18 before the portions of the batt strips covered by the hoods reach the suction duct 74. Even if the duct 74 is continuously at sub-atmospheric pressure, batt material will not be removed from the strip until the hoods 32 are laterally aligned with the ports 75, thus to direct the streams of air passing through said ports 75 from the hoods. Alternatively conventional apparatus may be used to evacuate duct 74 only periodically, that is when the hoods 32 are in the position substantially as shown in Figure 4.

When the apparatus is in the position shown in Figure 4, a timing cam 88 mounted on the shaft 84 engages the actuator 90 of a supply valve 87 in a compressed air supply pipe 88, which supplies air under pressure to nozzles 89. The nozzles 89 are directed laterally into each of the sets of hoods 32 which as previously mentioned have their respective end walls 92 at an appropriate angle to direct the convection current of air induced through the suction duct 74 and pressure-air nozzles 89 into the ports 75 which are then directly below the inclined ends 92 of the hoods 32. The stream of air picks up by convection the loosely compacted fibres of the segments of batt material localized beneath each hood of the sets of hoods 32 and carries such fibres away through the suction duct 74 to a suitable point of deposit (for example, the interior of the batt forming machine 14).

In some cases, suction alone is sufficient to remove the segments of batt material from beneath the hoods 32. In other cases, the addition of pressurized air from the nozzle 89 is beneficial. In any event, gaps 47 intervening between spaced pad portions 33 are formed by removing by convection segments of batt material beneath the hoods 32. To prevent loss of suction, the bars 85 may be provided with sealing pads 93 of rubber or the like which bridge across the conveyor belts 27 between the laterally spaced batt strips 18.

The removal of batt material segments

occurs concurrently with continued forward movement of the conveyor belts 27. Substantially immediately after the batt material segment has been removed from beneath the hoods 32, the cam 86 will have rotated to the point where the actuator 90 of valve 87 is released to shut off the supply of air to nozzles 89 and to de-energize blower 31. Accordingly, the batt strips 18 between the spaced sets of hoods 32 are not displaced by any convection current until the next set of hoods 32 is positioned upon the batt strips and reach the Figure 4 position when the cam 86 again actuates valve 87 and blower 31.

WHAT I CLAIM IS:—

1. A method of making individual pads from fibrous batt material in strip form which comprises the step of removing segments of said strip by subjecting said segments to a pneumatic pressure differential that acts to remove the batt segments from the strip.

2. A method as claimed in Claim 1, which comprises the step of directing a flow of air against the batt strip at desired positions of division to remove the segments of batt material by convection.

3. The method as claimed in Claim 2 in which said air flow is induced by exposing said batt material to suction.

4. The method as claimed in Claim 2 in which said air flow is induced by directing a stream of a gaseous medium under pressure on to said batt material.

5. A method as claimed in any of the preceding claims, in which an elongated strip is advanced in the direction of its elongation while segment removal takes place.

6. A method as claimed in any of the preceding claims, including the step of confining the batt segments which are to be removed.

7. A method as claimed in Claims 5 and 6, wherein a suction effect is applied to a confined portion of the strip as it advances, to suck away batt material and so leave a gap between longitudinally spaced-apart pad portions.

8. A method s claimed in Claims 5 and 6, wherein a stream of air is directed against the side of a confined portion of the strip as it advances, to remove batt material and so leave a gap between longitudinally spaced-apart pad portions.

9. A method according to Claims 7 and 8, wherein a stream of air is directed against said batt strip at the side of the segment-confining space opposite to that at which suction is applied.

10. A method as claimed in Claim 5 or Claim 6, characterised in that channelling used to confine a segment of batt material to be removed is moved in a cyclical path to effect periodic engagement with the batt strip.

11. The method as claimed in Claim 10, further characterised by the employment of a plurality of channelling means moving through cyclical paths synchronously with the movement of the strip to bring said channelling means successively into engagement with the moving strip, the distance apart of successive channelling means determining the length of a pad portion divided from the strip.

12. A method of making pads of fibrous material by covering pad portions formed as claimed in any of the preceding claims, which comprises the encasing of the spaced-apart pad portions and the intervening gaps in a continuous covering and severing said covering through the covered gap portions thereof to form separate covered pads.

13. The method claimed in Claim 12 including the additional step of sealing together cover portions opposite said gaps to separately encase said pad portion before severing said covering to form the separate covered pads.

14. The method according to Claim 12 or Claim 13 in which the cover is severed by tearing in a jagged pattern to fray out the fibres of the cover material.

15. The method according to any of Claims 12, 13 and 14 including the intermediate step of applying an adhesive to at least one face of the cover intended for contact with an encased pad portion and the other cover portion at the gaps.

16. The method according to Claim 15, wherein the adhesive is characterised by pliability after setting.

17. Apparatus for making individual pads from fibrous batt material in strip form, comprising means for supporting said strip and means for establishing a pneumatic pressure differential against segments of material so as to remove said segments from the strip, and thereby provide individual pads.

18. Apparatus as claimed in Claim 17, comprising means for inducing a convection stream of air against the strip.

19. Apparatus as claimed in Claim 17 or Claim 18, including means for at least partially enclosing said segment while subject to a pneumatic pressure differential.

20. Apparatus as claimed in Claims 17 and 18 comprising conveyor means for advancing batt material in strip form in the direction of its elongation and means for periodically subjecting said batt material to a pneumatic pressure differential to remove batt segments during the advance of the strip by said conveyor means.

21. Apparatus as claimed in Claim 20, including an air hood and conveyor means for disposing said hood upon a segment to be removed to at least partially enclose said segment when it is exposed to said pneumatic pressure differential.

22. Apparatus as claimed in Claims 20 and 21 wherein said conveyor means advance the strip in the direction of its elongation past means which establish a pneumatic pressure

differential by an air current to remove a segment of batt material from that portion of the strip which is advanced by said conveyor means into the path of said air current, said air hood having means for advancing in step with said conveyor means and for positioning it over said segment, whereby said hood serves as a channel for said air current.

23. Apparatus according to Claim 22, in which the means to establish said pressure differential comprises a suction duct having a port exposed to said batt strip and said hood has means substantially sealing said hood against said batt strip, in combination with means for evacuating said duct when said hood and the batt segment sealed thereby are adjacent said port.

24. Apparatus as claimed in Claim 23, in which said suction duct port is offset laterally from the path of travel of the batt strip, and in which said means to establish said pressure differential further comprises a source of pressurized air and a nozzle at the side of the strip opposite the vacuum port and directed laterally into said hood and against the strip and whereby the air current is induced in a direction laterally of the movement of the conveyor.

25. In combination with apparatus for making individual pads from batt material in strip form, as claimed in any of the preceding Claims 17 to 24, means for encasing longitudinally spaced pad portions within a continuous covering which extends over the gaps between said spaced pad portions, and means for severing the cover between the encased pad portions.

26. Apparatus as claimed in Claim 24, having means for sealing together said gaps before said covering is severed through said sealed portions to form separate covered pads.

27. Apparatus as claimed in Claim 25 or Claim 26, including a cut-off knife operating to sever through the covering between spaced pad portions encased in said covering.

28. Apparatus as claimed in Claim 27 in which the knife comprises blades having teeth which tear the covering in a jagged pattern to fray out the fibres of the cover material.

29. Apparatus as claimed in Claim 28 in which said knife is further provided with means for clearing said teeth from severed portions of the torn covering.

30. Apparatus as claimed in Claim 25, in which one of said knife blades has a clearing bar mounted for reciprocation thereon.

31. Apparatus as claimed in any of Claims 27 to 30, characterised in that one of said blades is provided with means mounting it for rotation, the other of said blades being stationary, and including means for moving said clearing bar to clear said stationary blade after co-action of said blades.

32. Apparatus as claimed in Claim 31, having a resiliently-supported apron having an end terminating adjacent the statonary knife and yieldable under pressure of co-action of said knives to lower the covered uncut pads against said stationary knife, the resiliency of said apron being sufficient to lift said covered pads away from engagement with the stationary knife after the covering has been severed, thereby to permit continued advance of the covered pads beyond said stationary knife pending the next succeeding co-action of said knives.

33. Methods of forming pad portions from fibrous matt material as claimed in any of the preceding Claims 1 to 11, characterised in that a plurality of batt strips are dealt with simultaneously to form parallel rows of longitudinally spaced pad portions, with or without the subsequent covering of said pad portions in accordance with a method as claimed in any of Claims 11 to 16.

34. Methods of dividing continuous batt material in strip form into discrete portions substantially as herein described.

35. Methods of forming individual covered pads from otherwise continuous batt strips substantially as herein described.

36. Apparatus for making pad portions from fibrous matt material as claimed in any of the preceding Claims 17 to 24, characterised in that provision is made for simultaneously operating on a plurality of parallel batt strips.

37. Apparatus as claimed in Claim 36, when employing air hoods as claimed in any of Claims 21 to 24, further characterised in that provision is made to prevent egress of air to a transversely disposed plurality of air hoods through spaces existing between parallel moving batt strips.

38. Apparatus for forming continuous batt strips into pad-like portions, with or without means for encasing or wrapping said pads, constructed substantially as hereinbefore described with reference to the accompanying drawings.

39. Pads of batt material, whether or not encased or wrapped, when made by the methods and/or apparatus herein described.

STEVENS, LANGNER, PARRY & ROLLINSON,
Chartered Patent Agents,
Agents for the Applicants.

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Fig. 1.

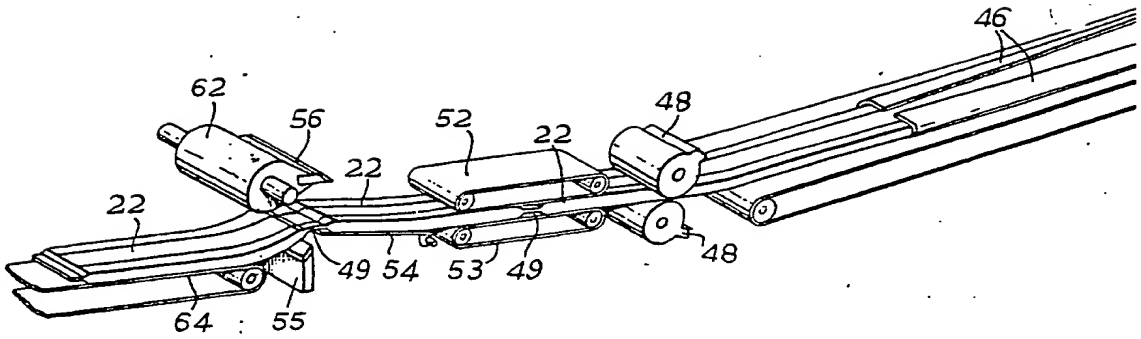
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Fig. 2.

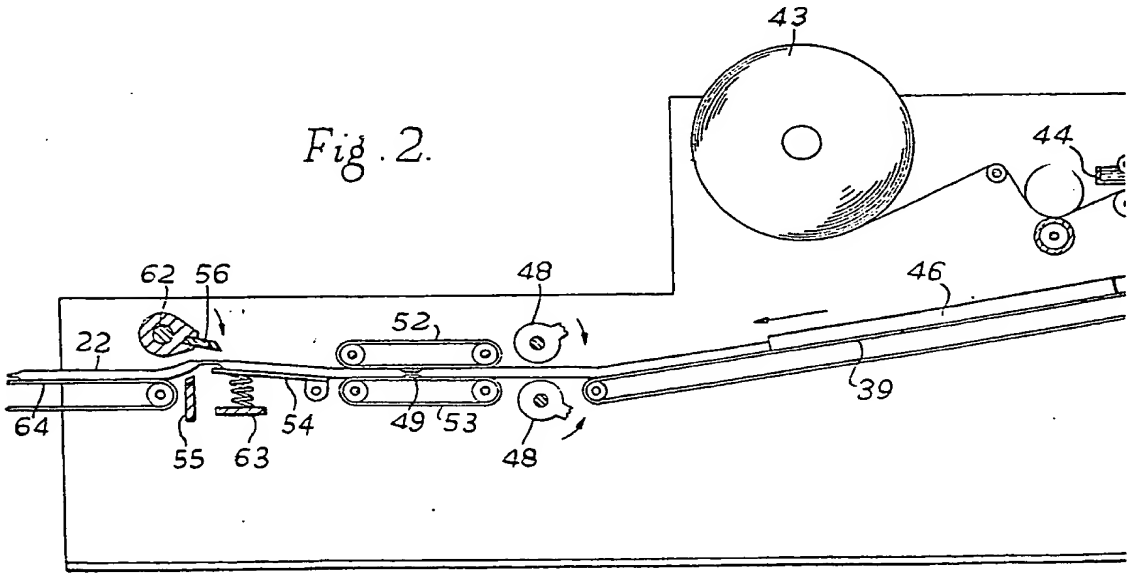
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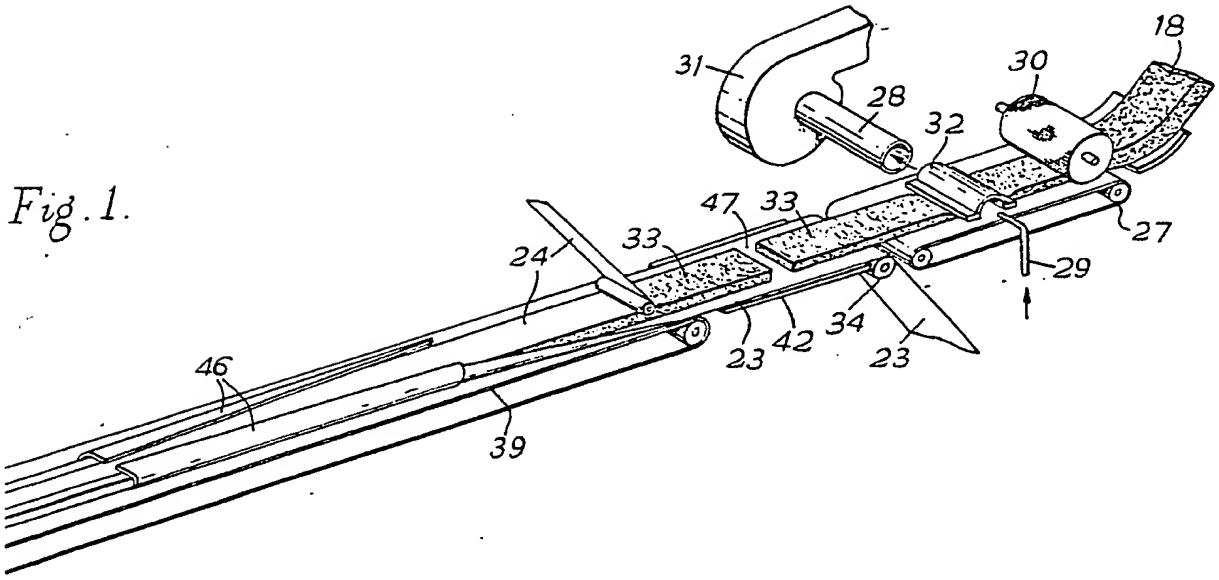
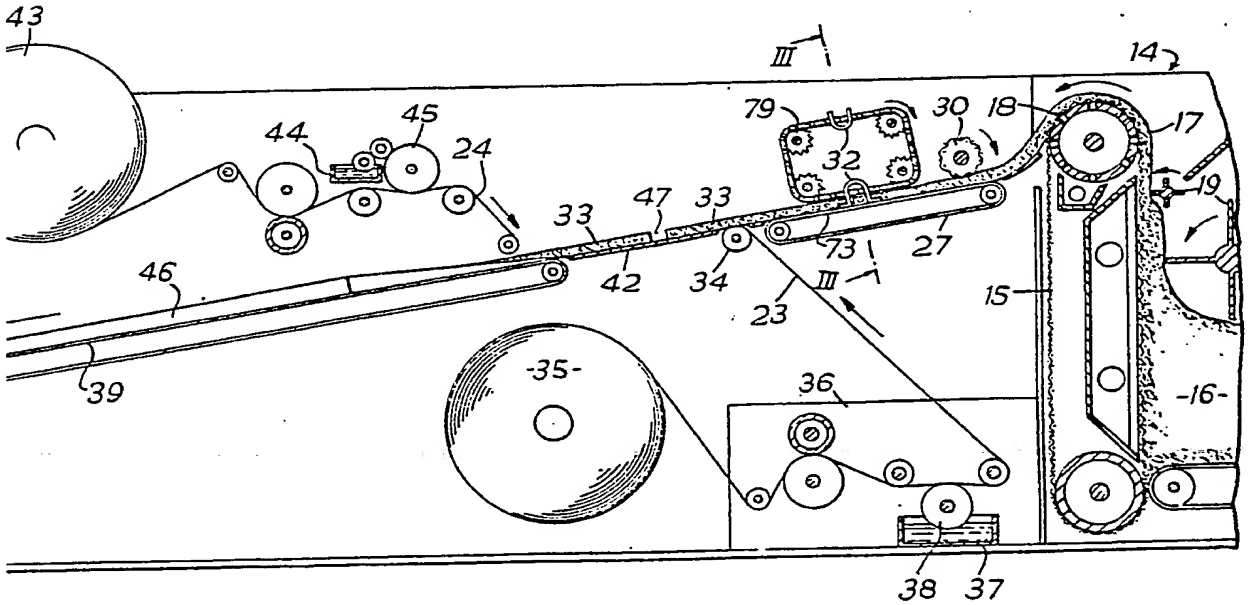
Fig. 1.





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Sheet 1

Fig. 1.

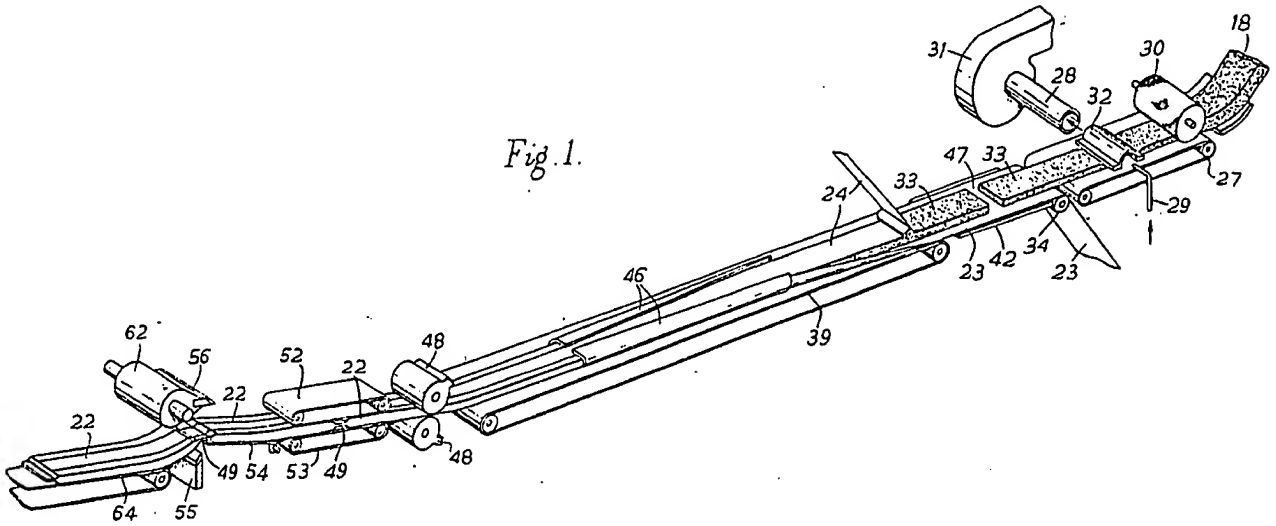
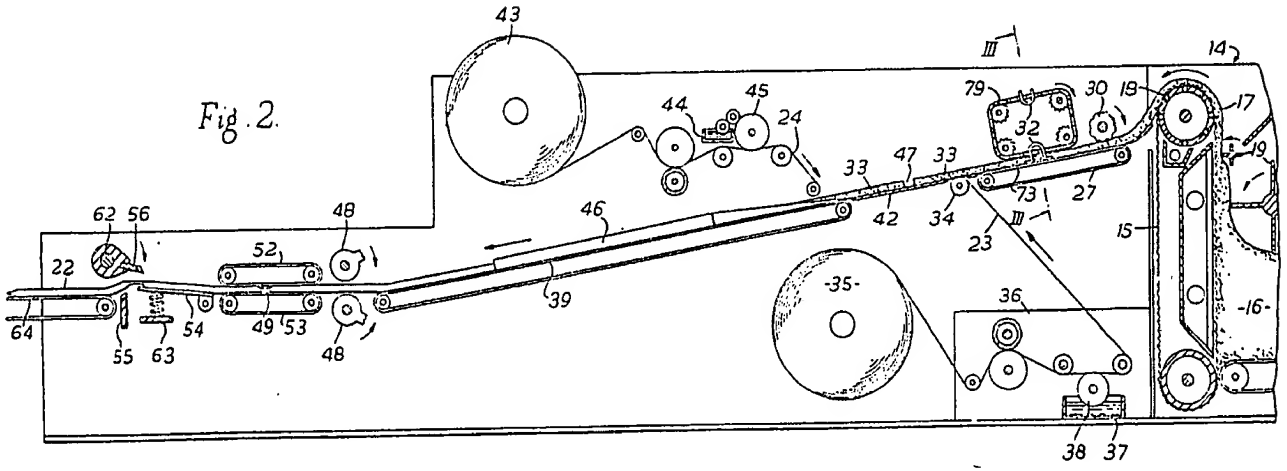


Fig. 2.



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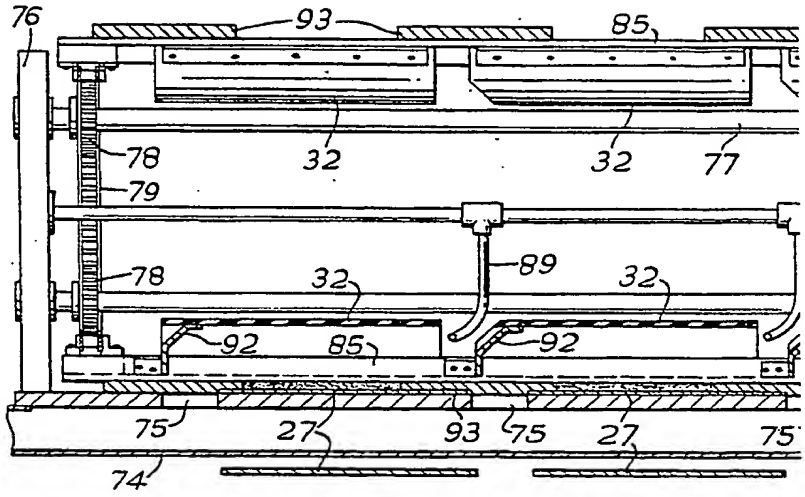
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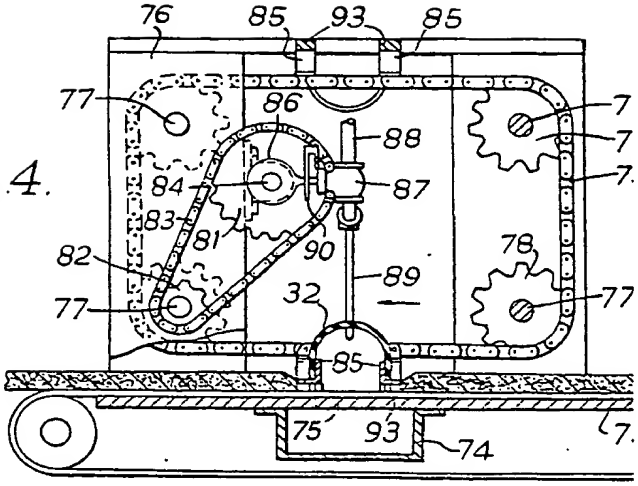
Fig. 4.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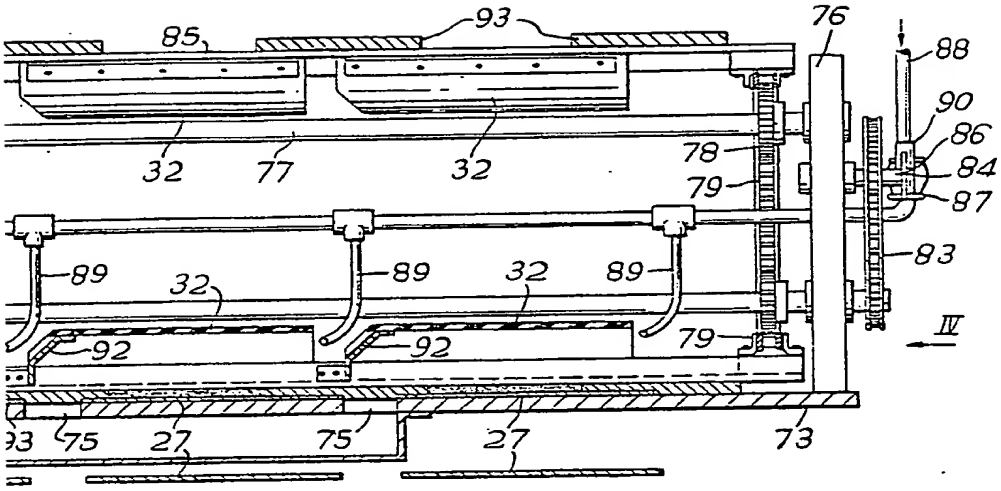
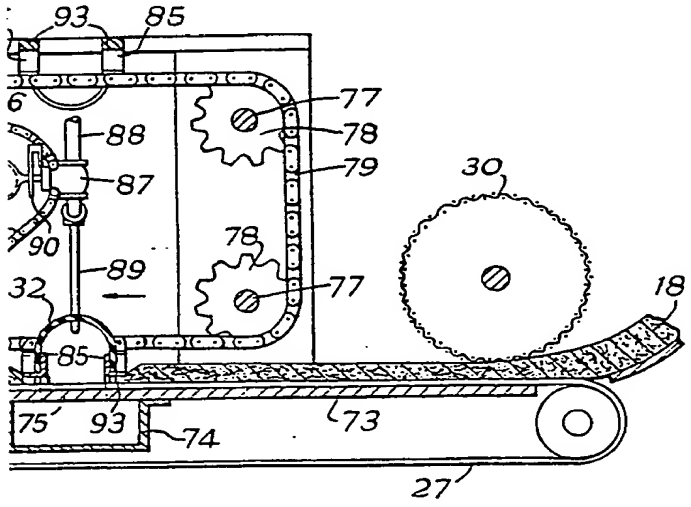
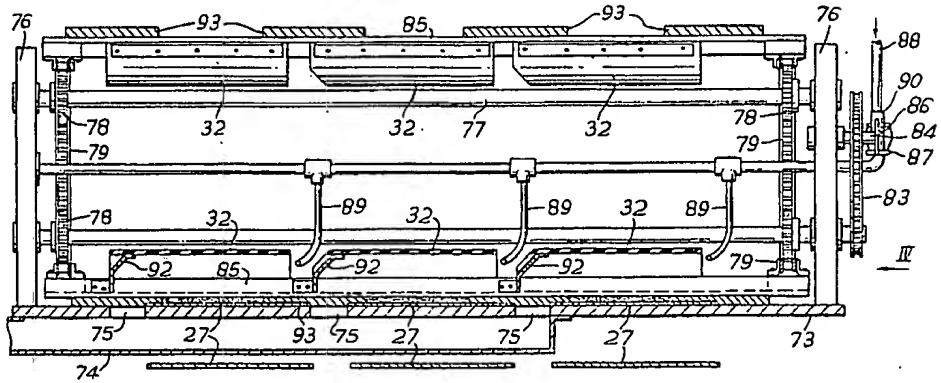
884194 COMPLETE SPECIFICATION
4 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 2





884194 COMPLETE SPECIFICATION
4 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 2

Fig. 3.



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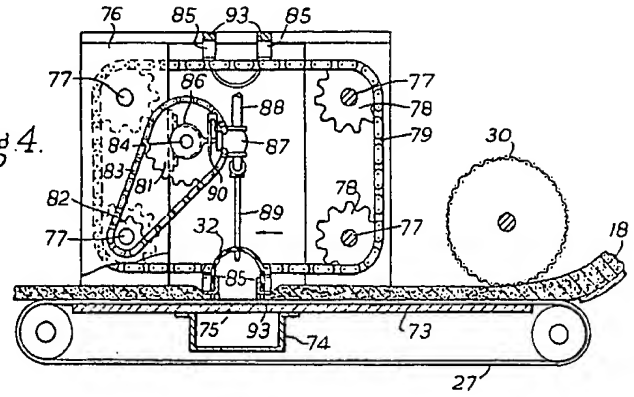

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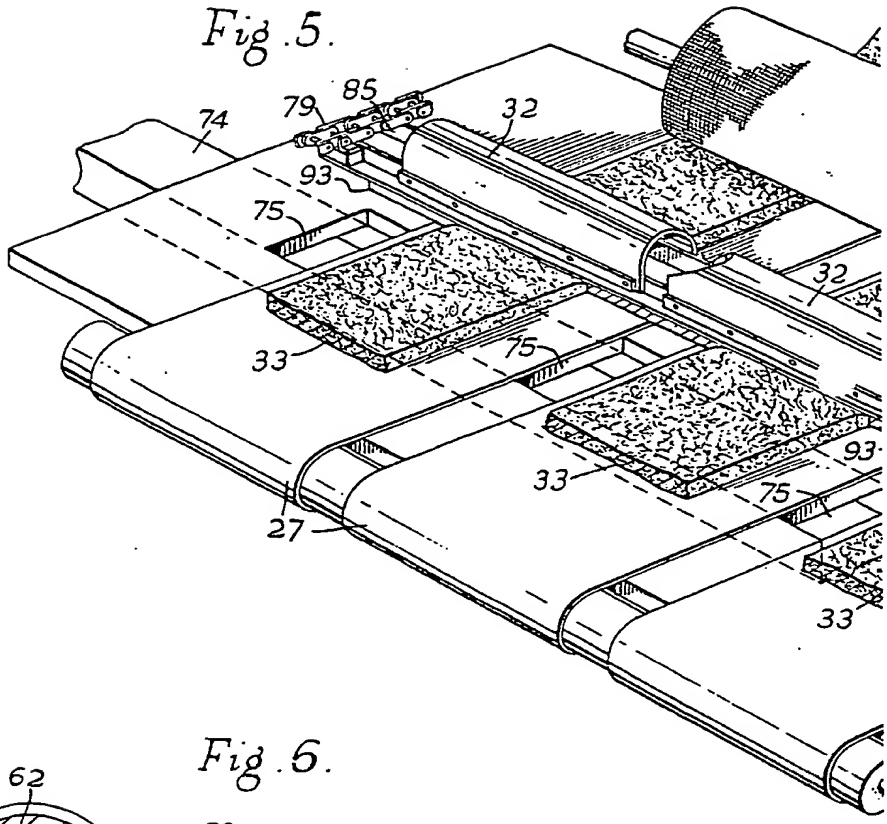
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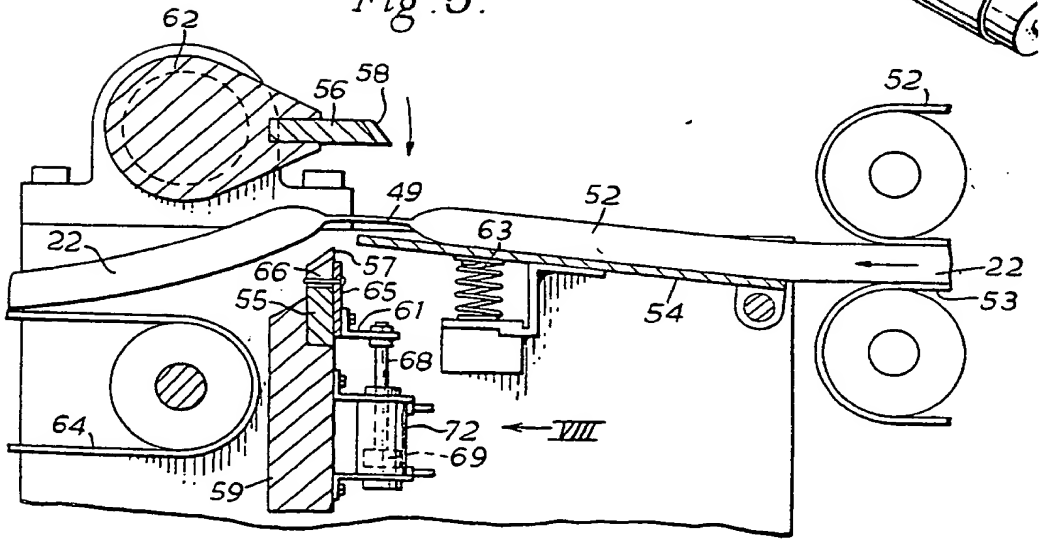
Fig. 6.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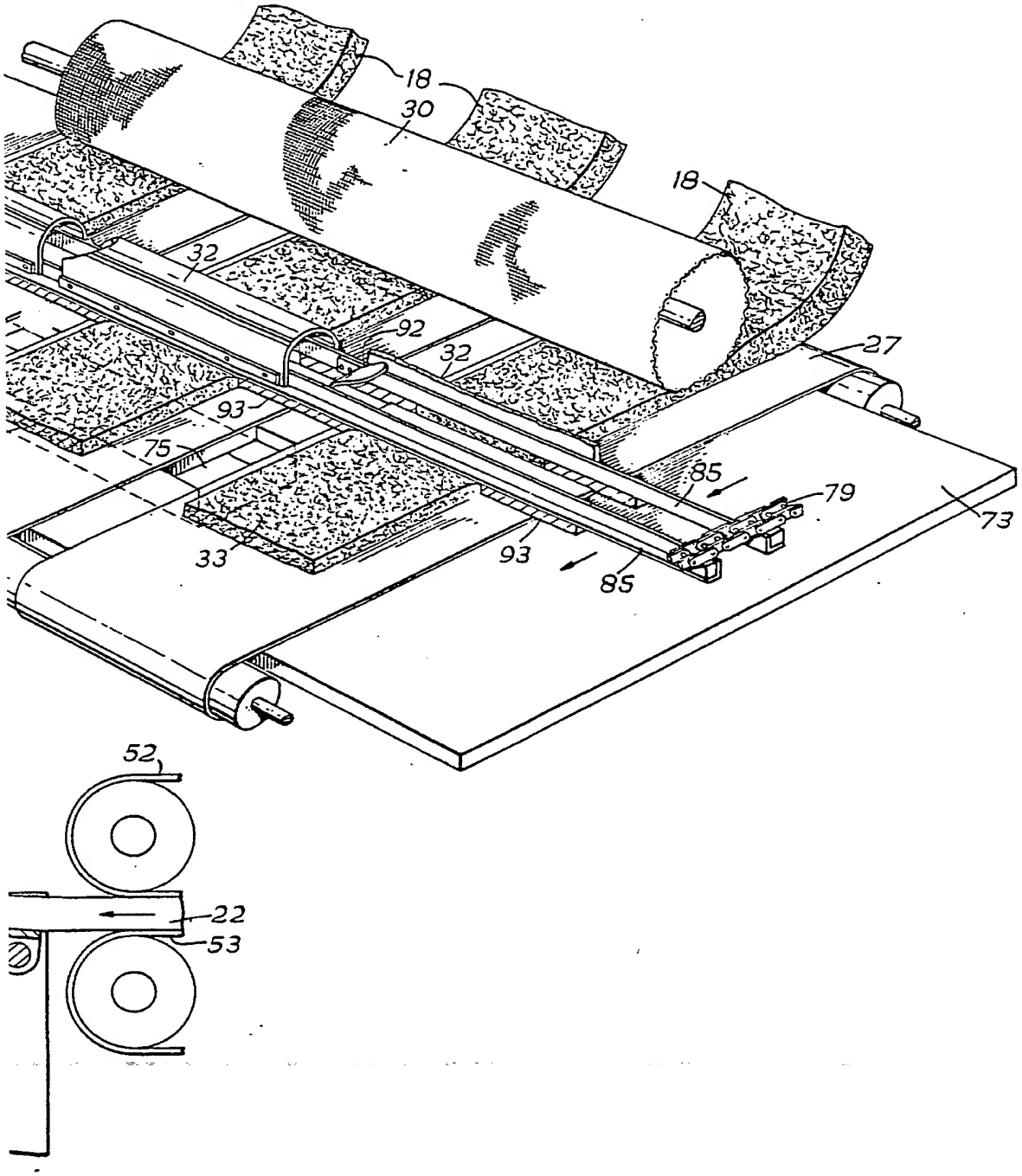
884194 COMPLETE SPECIFICATION

4 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 3



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4 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 3

Fig. 5.

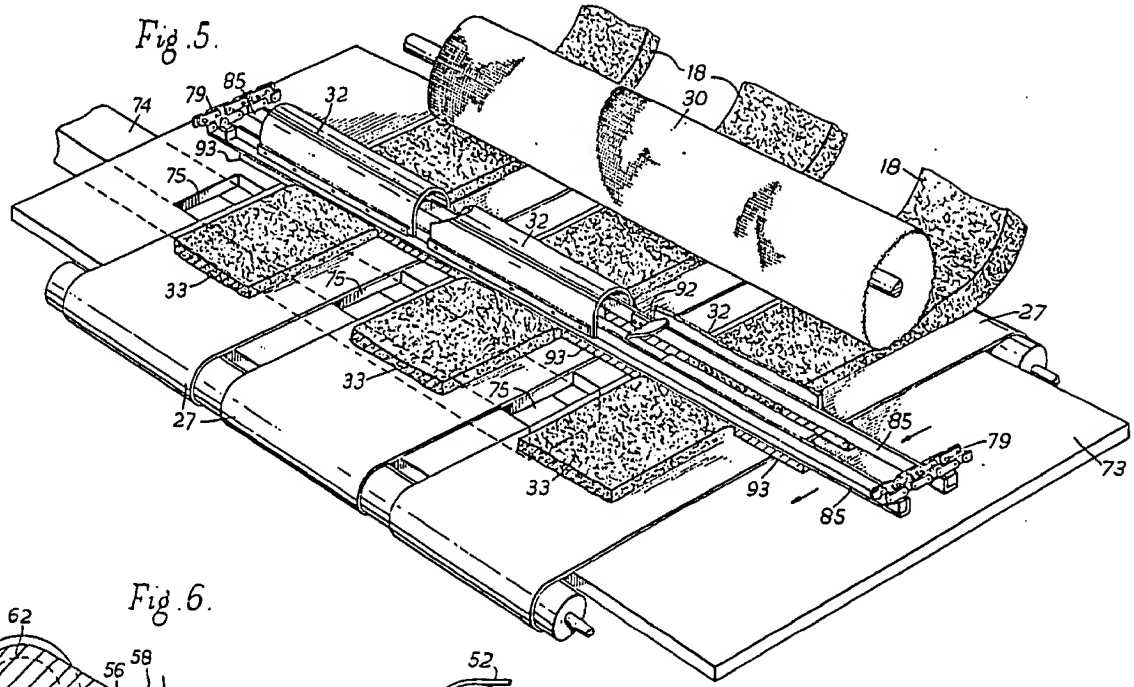
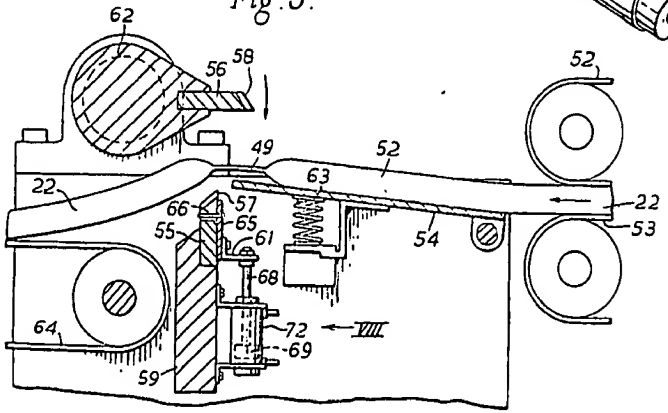


Fig. 6.



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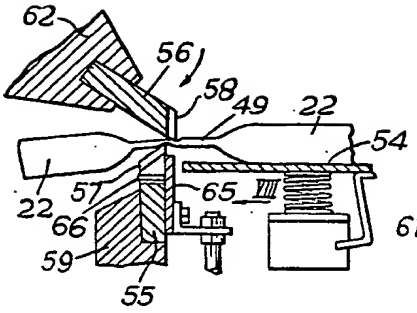
Sheet 4

Fig. 7.



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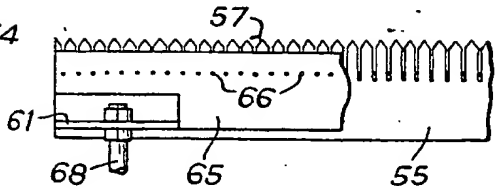

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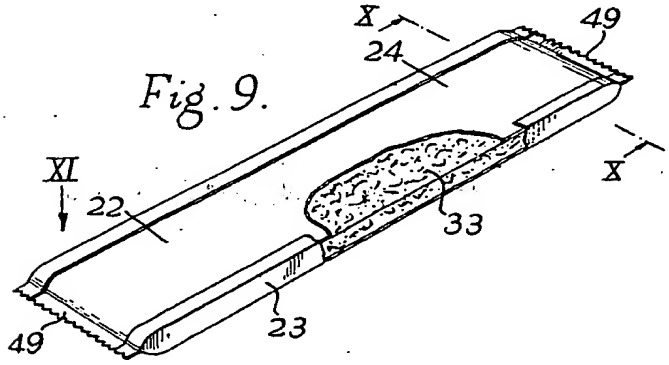

Fig. 10.

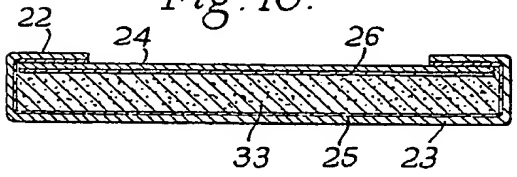

Fig. 11.